



## SCC DIAGNOSTICS TOOL BOX



### R-EF-1: Ability of Organic and Inorganic Bedding Materials to Promote Growth of Environmental Bacteria

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#### Abstract

The major objective of this study was to contrast the ability of 4 commonly utilized bedding materials to promote growth of environmental bacteria under controlled conditions. A second objective was to describe the relationship between bacterial growth and specific biochemical or nutritional properties of these bedding materials. Unused samples of clean sand (CS; n = 20), recycled sand (RS; n = 21), digested manure solids (DS; n = 15), and shavings (SH; n = 15) were collected from bedding storage areas on 49 commercial Minnesota and Wisconsin dairy farms. Sterilized bedding samples were inoculated with *Klebsiella pneumoniae* and *Enterococcus faecium* then incubated, in triplicate, for 72 h at 37°C. Subsamples were collected after 0, 24, 48, and 72 h of incubation for culture and enumeration of bacteria. Subsamples of bedding were also tested for pH, total C content (%), and total N content (%). If bacterial growth occurred, peak levels were typically achieved within 24 h. Digested manure solids promoted the greatest amounts of growth of *K. pneumoniae*, followed by RS and then SH, whereas CS promoted the least. There would seem to be a tradeoff in selecting SH as a bedding material, because it supported moderate growth of *K. pneumoniae* but caused a rapid decline in the numbers of *E. faecium*. However, RS, CS, and DS each only supported relatively small amounts of growth of *E. faecium*, so the benefit of SH relative to other bedding materials is limited. High bedding pH may partially explain why some bedding materials supported growth of *E. faecium* (e.g., DS and RS). Both high bedding pH (e.g., as for DS or RS) and high total C (%) content (e.g., as for DS and SH) may partially explain why some bedding materials supported growth of *K. pneumoniae*.

**Key words:** bedding, environmental mastitis, bacteria

